
Buying Solar Equipment and Services

Like any other consumer purchase, buying solar equipment requires careful thought. Will the system meet your expectations and save you money? Is the system covered by a warranty? Does the installer have a good track record and references? These are just some of the questions you should answer before investing in a solar energy system.

Exploring Energy Options

Dollar for dollar, investments in energy efficiency such as building insulation, water conservation devices and efficient lighting and appliances will save the most energy. These investments in efficiency will allow you to get more useful energy out of your solar system.

The first step to getting your energy budget under control is to arrange for a home energy audit. Certain utilities now offer audits as part of their demand-side management (energy efficiency)

programs. Contact your utility and determine what services they offer. You may also contact the

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Vermont Department of Public Service for a list of energy auditors. An energy audit should tell you three things:

- Where and how you are currently using energy.
- What options you have to reduce or improve the efficiency of your energy use.
- What are the cost and savings associated with each of these options.

Shopping For Solar

Just as there are many types of solar energy systems, there are many types of solar designers, installers and dealers. A designer may be a licensed architect, a

professional engineer or a knowledgeable solar installer. An installer may be a licensed plumber, electrician or a firm specializing in solar energy. You may also choose to design your own system and buy solar equipment directly from a dealer to install yourself. Your choice depends upon the type of solar system you are considering, the scope of the project and your own skills.

To assist the public in choosing solar energy systems, the Solar Rating and Certification Corporation (SRCC) and the Florida Solar Energy Center (FSEC) rate solar hot water and pool collectors. These ratings will not tell you how well a system will perform, but will give you an indication of the efficiency of the system's collectors. A list of these collector ratings is available from the Vermont Department of Public Service.

Before investing any money in a system, however, you should be able to answer the following questions:

- How much money will the system save on an annual basis?
- What routine maintenance must be done and how much will it cost?
- How long is the system expected to last?
- Do you understand the limitations of the system?
- Is a complete owner's manual provided with the system?
- Does the contractor have good references?
- Has the contractor provided a written contract and warranty?

Table 2: Cost Comparisons

WATER HEATER TYPE	INSTALLED COST ¹	1ST YEAR ENERGY COST ²	ANNUAL MAINTENANCE ³	30-YEAR LIFE-CYCLE COST ⁴
Electric	\$500	\$450	\$10	\$32,100
Propane	\$750	\$350	\$10	\$26,300
Solar w/ elec	\$3200	\$180	\$15	\$21,200
Solar w/ LP	\$3,625	\$170	\$15	\$21,000

Notes:

1. Prices are approximate for new construction.
2. Electric = \$.10/kWh, 90% efficiency. Propane = \$1.39/gal., 59% efficiency.
3. Assumes 5% inflation and equipment replacement as necessary.
4. 30-year ownership cost, including energy and maintenance expenses, inflated at 5% annually.

Judging Cost Savings

The most accurate way to quantify the cost savings associated with a solar energy system is to compare its *life-cycle cost* with that of other energy options. Life-cycle cost simply refers to the total cost of installing, using, and maintaining a piece of equipment over its lifetime. Whatever system has the lowest life-cycle cost is the most economic system.

For example, an electric hot water heater is inexpensive to install but expensive to run. A solar hot water system is expensive

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cost of each, the electric system looks like the clear winner. However, if we add up the operating cost of each system over 20 years, the solar system may be much less expensive over its lifetime.

An energy consultant or solar dealer should be able to help you calculate the life-cycle cost of your various energy options. Another way to look at a solar "investment" is to calculate its simple rate of return, allowing a comparison with other investments such as a savings accounts or certificate of deposit. A good solar contractor can help you with this. It is important to note that since fuel bills are paid with after-tax income, the annual savings from a solar energy system is equivalent to a *non-taxable* return on investment. For a look at how a solar system compares with other hot water systems (Table 2) .

Judging A Contractor

A solar system is only as good as the quality of the installation. Many perfectly good systems have failed to perform adequately because of improper installation, poor quality installation materials or lack of maintenance knowledge by the owner.

Before hiring a solar designer or contractor, ask for references. Firms in business for years will have a clear track record and reputation. Less information may be available about newer firms, but they should still be able to provide references and show you *installed* examples of systems similar to what you are considering.

Almost all solar systems require some periodic maintenance. Is there a complete owners' manual available for the system that explains routine operation and necessary maintenance? Will the contractor sign a maintenance agreement with you? Has the contractor provided good service and warranty coverage for previous clients?

Contracts & Warranties

A contract is a legally binding agreement between you and the firm or person you are hiring. It should specify in detail all equipment that will be installed and all services that will be provided by the contractor. A *fixed-price contract* should specify the exact amount you will pay upon satisfactory completion of the job. A *time-and-materials contract* should specify the price of all materials and the hourly price of labor. It may also include a "not to exceed" price for the total job. Upon completion of the job the contractor should submit an itemized bill of the labor and materials actually used.

All contracts should include clear language that tells how and when payments will be made. Typically, contractors ask for an initial deposit, a certain amount when the job is complete and then the final payment within 30 days after that. The contract should never force you to pay in full before a job is complete and you have had a chance to inspect the work.

The American Institute of Architects (A.I.A.) publishes a four-page contract form (Document A101) entitled, *Standard Form of Agreement Between Owner and Contractor*, which covers most circumstances and is easy to use. If you find a company's contract difficult to understand or incomplete, request that the A.I.A. form be used.

Along with a contract, a homeowner should request a written warranty statement from the contractor. Under federal law, a warranty must be designated as either "full" or "limited." A *full warranty* guarantees that a product will be repaired or replaced at no cost to any owner over a specified

period of time. A *limited warranty* will limit a guarantee in some way such as covering only the cost of the equipment and not the labor to fix it, covering only the original owner of the equipment or prorating the value of the equipment as it gets older.

Be sure to understand what the warranty says, what it covers and who it is with. Many times equipment warranties run with the manufacturer of the equipment and not with the installer. Thus they depend upon the good faith

and economic health of a distant company.

If you have a question about a contract or warranty or have a problem with a company carrying out the provisions of a contract or warranty, you may contact the Consumer Assistance Program of the Vermont Attorney General's Office, telephone: (802) 656-3183 or 1-800-649-2424 within Vermont.